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Chen

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(54) **SYSTEMS AND METHODS FOR ENFORCING DATA LOSS PREVENTION POLICIES ON MOBILE DEVICES**

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G06F 21/60 (2013.01)
G06F 21/62 (2013.01)

(52) **U.S. Cl.**
CPC ***H04L 63/20*** (2013.01); ***G06F 21/604*** (2013.01); ***G06F 21/6218*** (2013.01); *H04L 63/102* (2013.01)

(58) **Field of Classification Search**
CPC ... H04L 63/20; H04L 63/102; H04L 63/0277; G06F 21/604; G06F 21/6218
USPC 726/1
See application file for complete search history.

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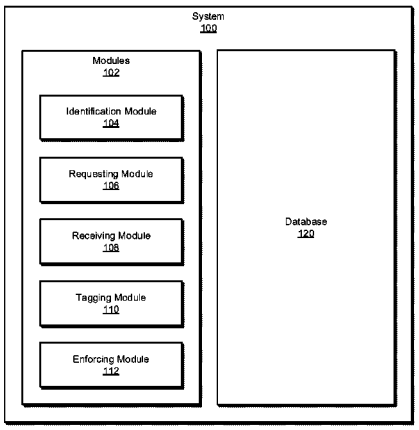
(57) **ABSTRACT**

A computer-implemented method for enforcing data loss prevention policies on mobile devices may include (1) identifying a mobile device that connected to a network and that may include sensitive data and that is in a predetermined state that is designated for transferring data for data loss prevention analysis, (2) requesting, from a data loss prevention policy database via the network, a data loss prevention policy category for the sensitive data based on an analysis the sensitive data, (3) receiving the data loss prevention policy category, tagging, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag and (4) enforcing on the mobile device, based on the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data. Various other methods, systems, and computer-readable media are also disclosed.

20 Claims, 7 Drawing Sheets



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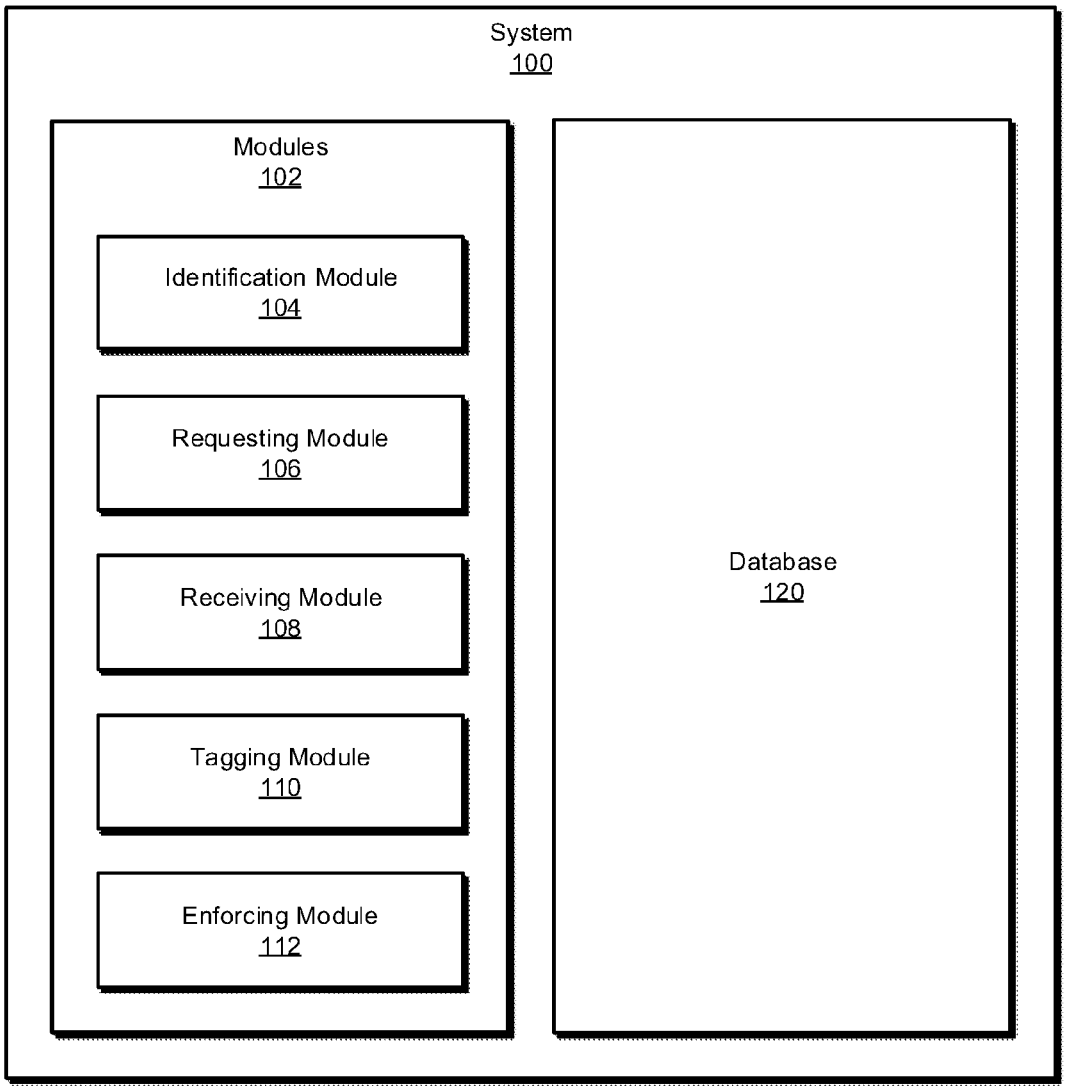
System
100
Modules
102
Identification Module
104
Requesting Module
106
Receiving Module
108
Tagging Module
110
Enforcing Module
112
Database
120

FIG. 1

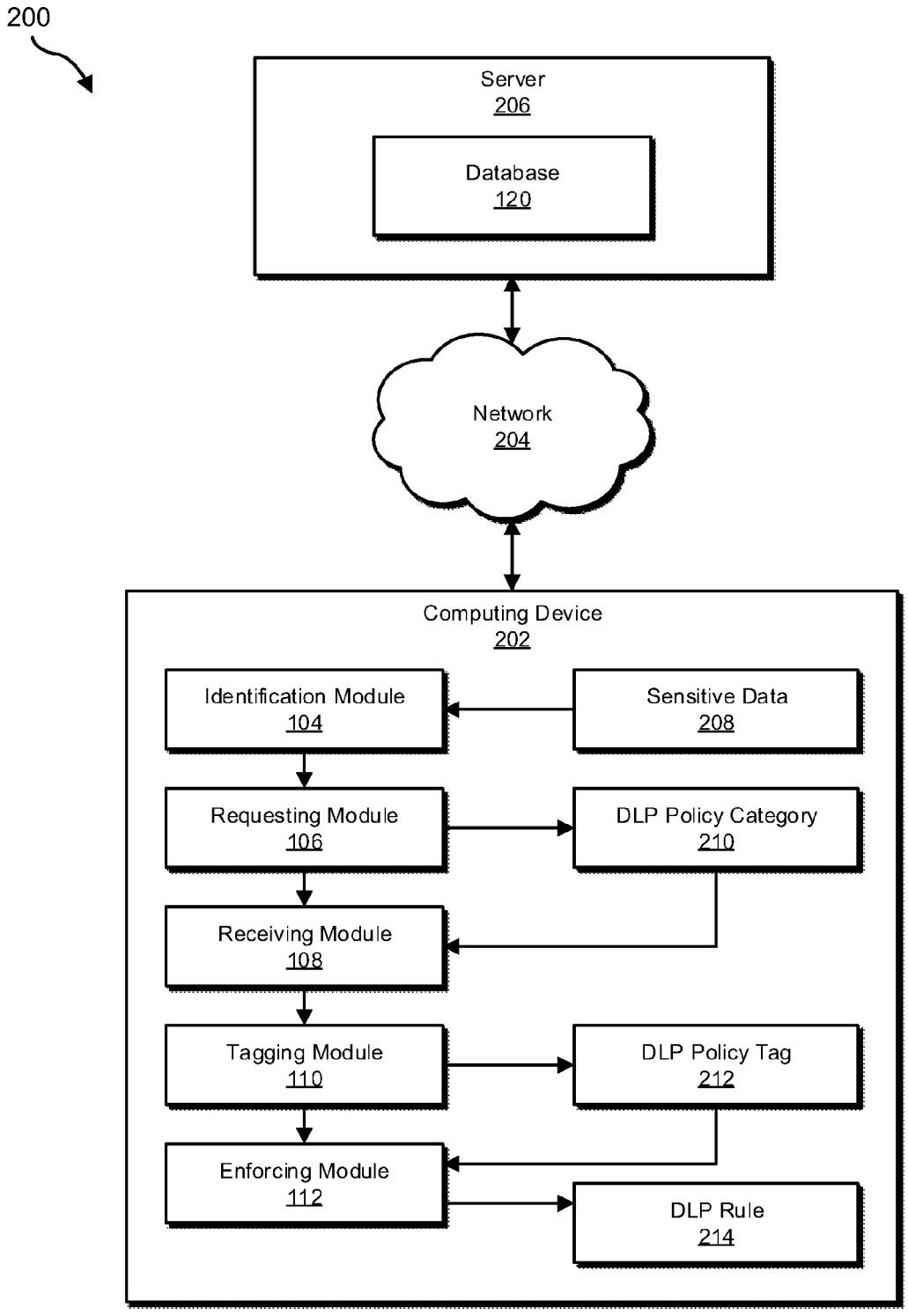
200
Server
206
Database
120
Network
204
Computing Device
202
Identification Module
104
Sensitive Data
208
Requesting Module
106
DLP Policy Category
210
Receiving Module
108
Tagging Module
110
DLP Policy Tag
212
Enforcing Module
112
DLP Rule
214

FIG. 2

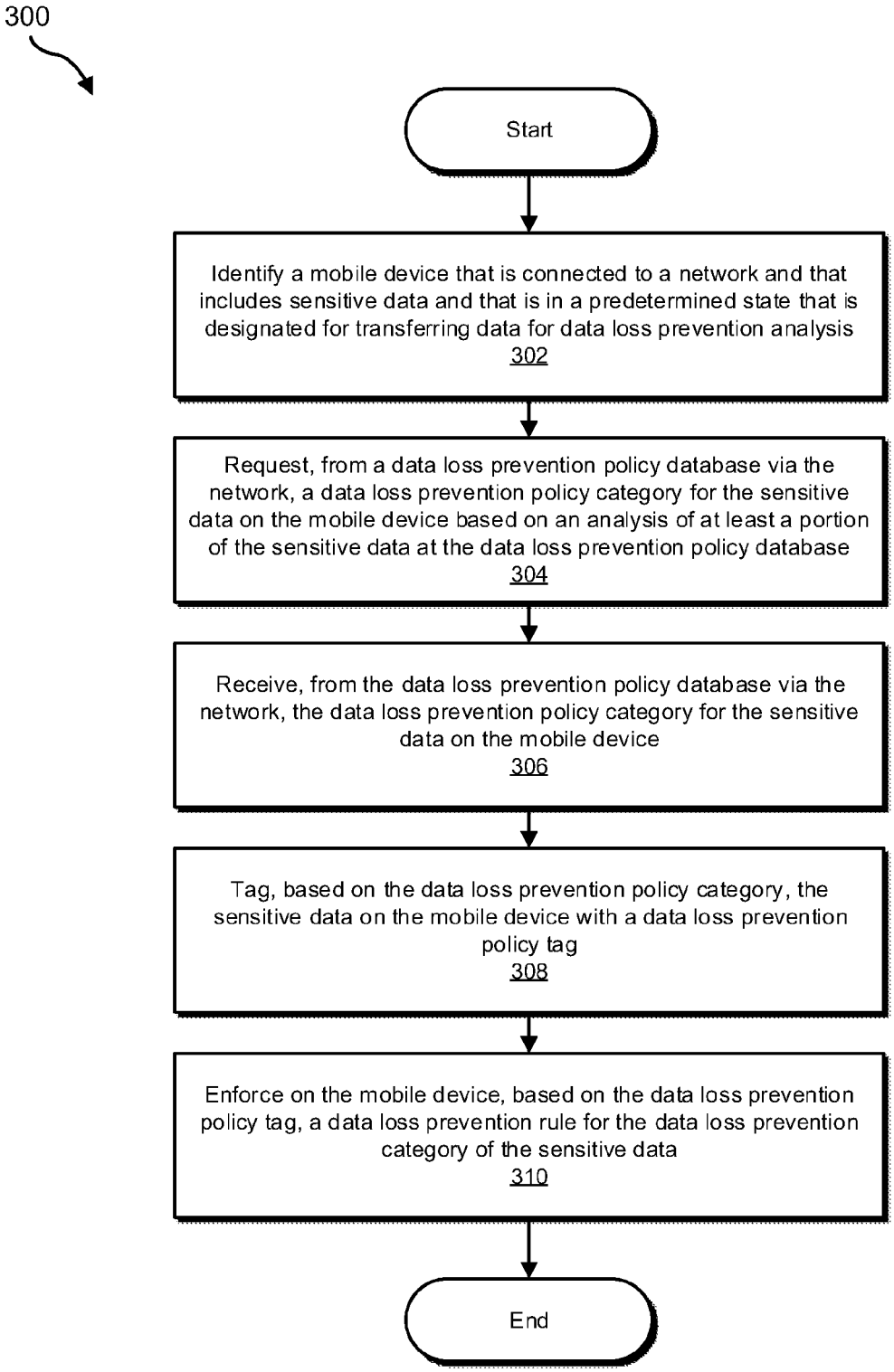
300
Start
Identify a mobile device that is connected to a network and that includes sensitive data and that is in a predetermined state that is designated for transferring data for data loss prevention analysis
302
Request, from a data loss prevention policy database via the network, a data loss prevention policy category for the sensitive data on the mobile device based on an analysis of at least a portion of the sensitive data at the data loss prevention policy database
304
Receive, from the data loss prevention policy database via the network, the data loss prevention policy category for the sensitive data on the mobile device
306
Tag, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag
308
Enforce on the mobile device, based on the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data
310
End

FIG. 3

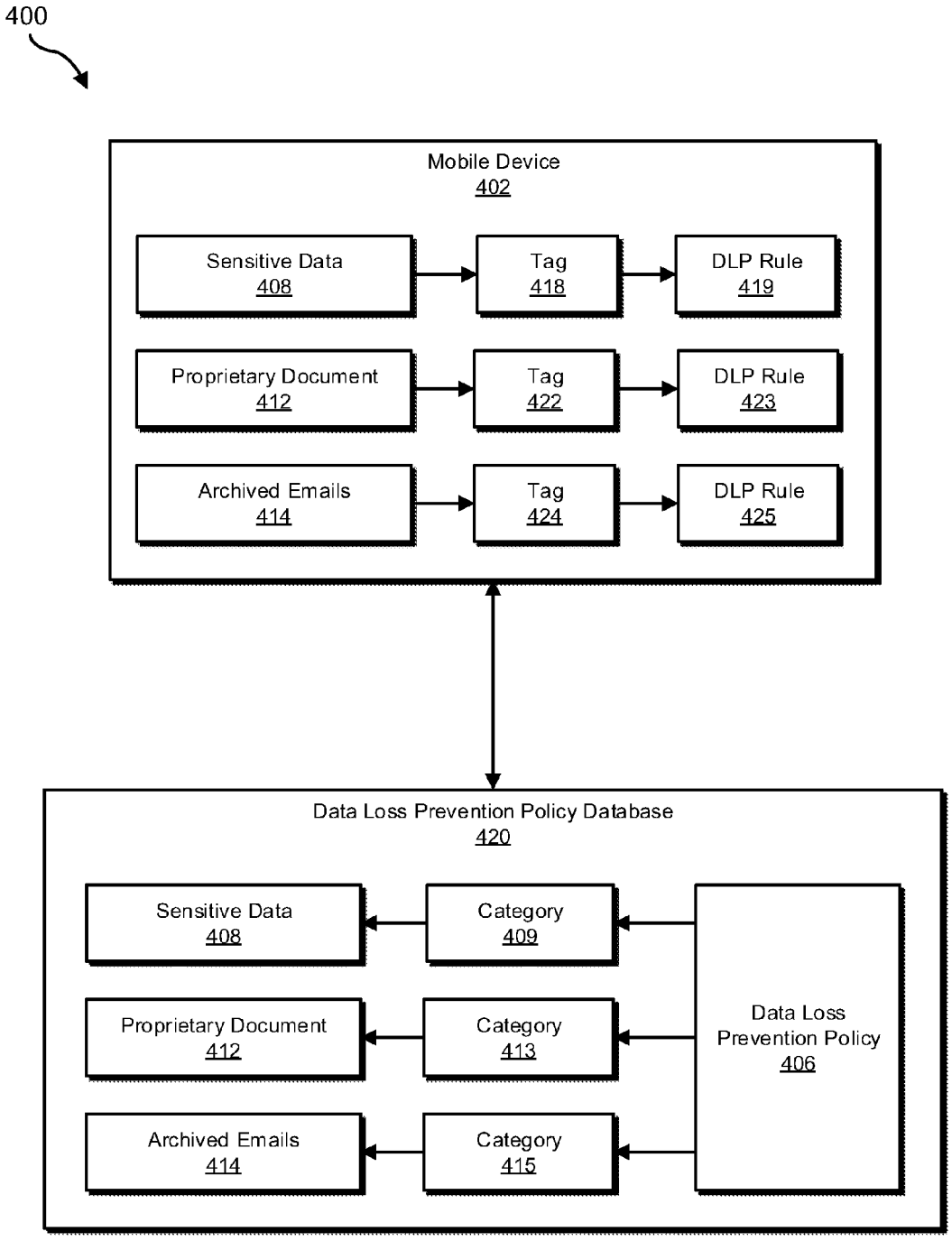
400
Mobile Device
402
Sensitive Data
408
Tag
418
DLP Rule
419
Proprietary Document
412
Tag
422
DLP Rule
423
Archived Emails
414
Tag
424
DLP Rule
425
Data Loss Prevention Policy Database
420
Sensitive Data
408
Category
409
Proprietary Document
412
Category
413
Archived Emails
414
Category
415
Data Loss Prevention Policy
406

FIG. 4

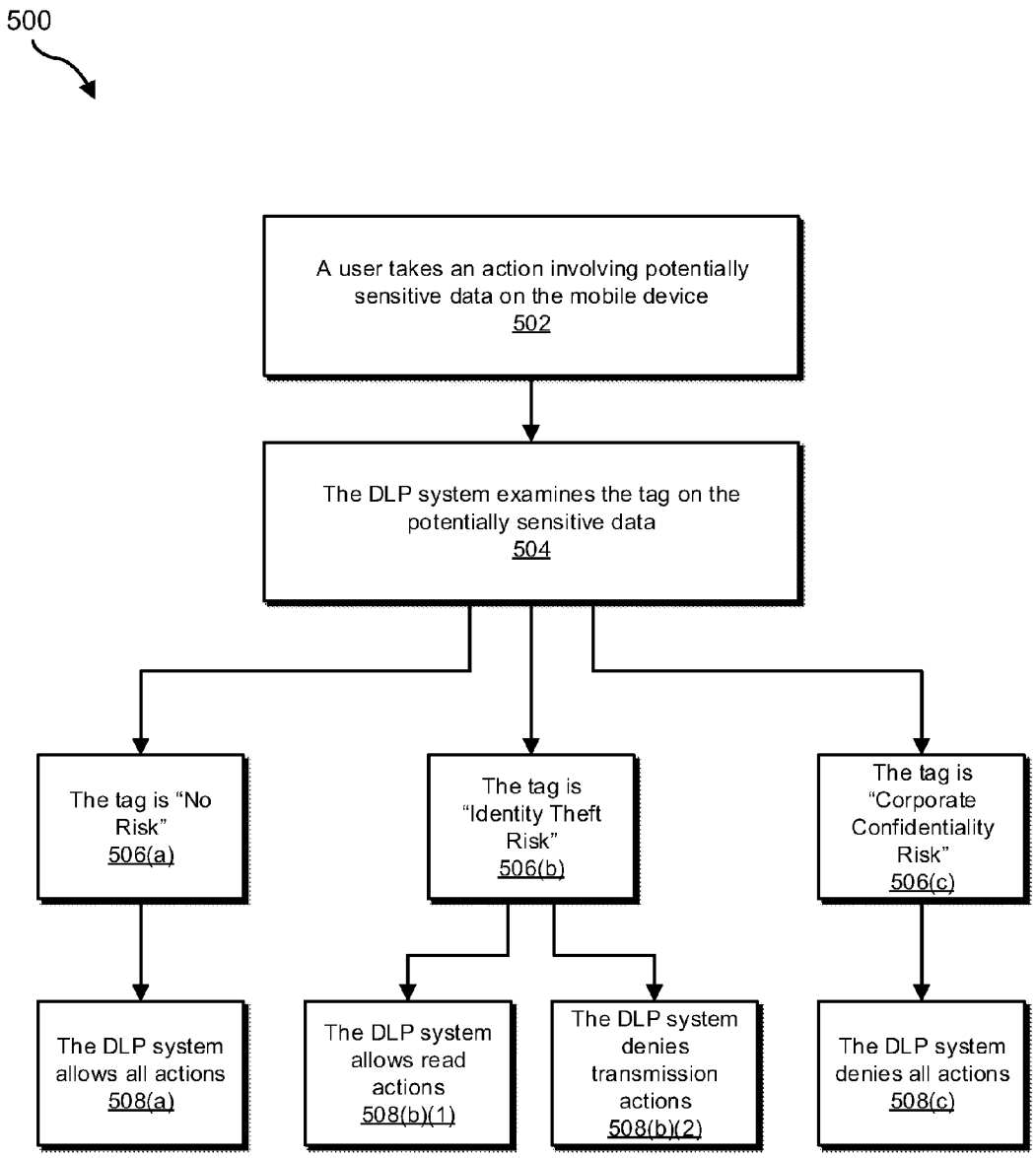
500
A user takes an action involving potentially sensitive data on the mobile device
502
The DLP system examines the tag on the potentially sensitive data
504
The tag is "No Risk"
506(a)
The tag is "Identity Theft Risk"
506(b)
The tag is "Corporate Confidentiality Risk"
506(c)
The DLP system allows all actions
508(a)
The DLP system allows read actions
508(b)(1)
The DLP system denies transmission actions
508(b)(2)
The DLP system denies all actions
508(c)

FIG. 5

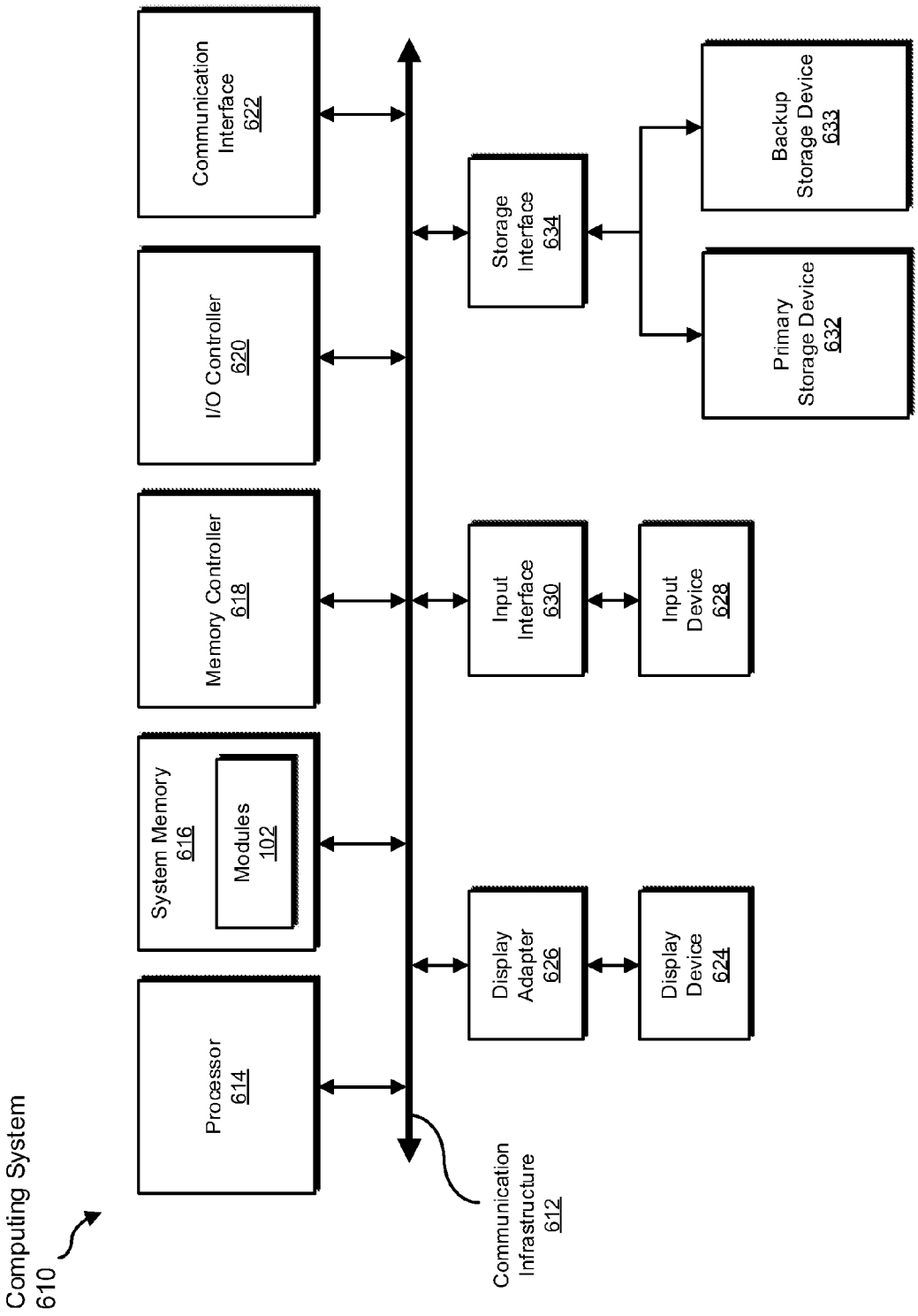
Computing System
610
Processor
614
System Memory
616
Modules
102
Memory Controller
618
I/O Controller
620
Communication
Interface
622
Communication
Infrastructure
612
Display
Adapter
626
Display
Device
624
Input
Interface
630
Input
Device
628
Storage
Interface
634
Primary
Storage Device
632
Backup
Storage Device
633

FIG. 6

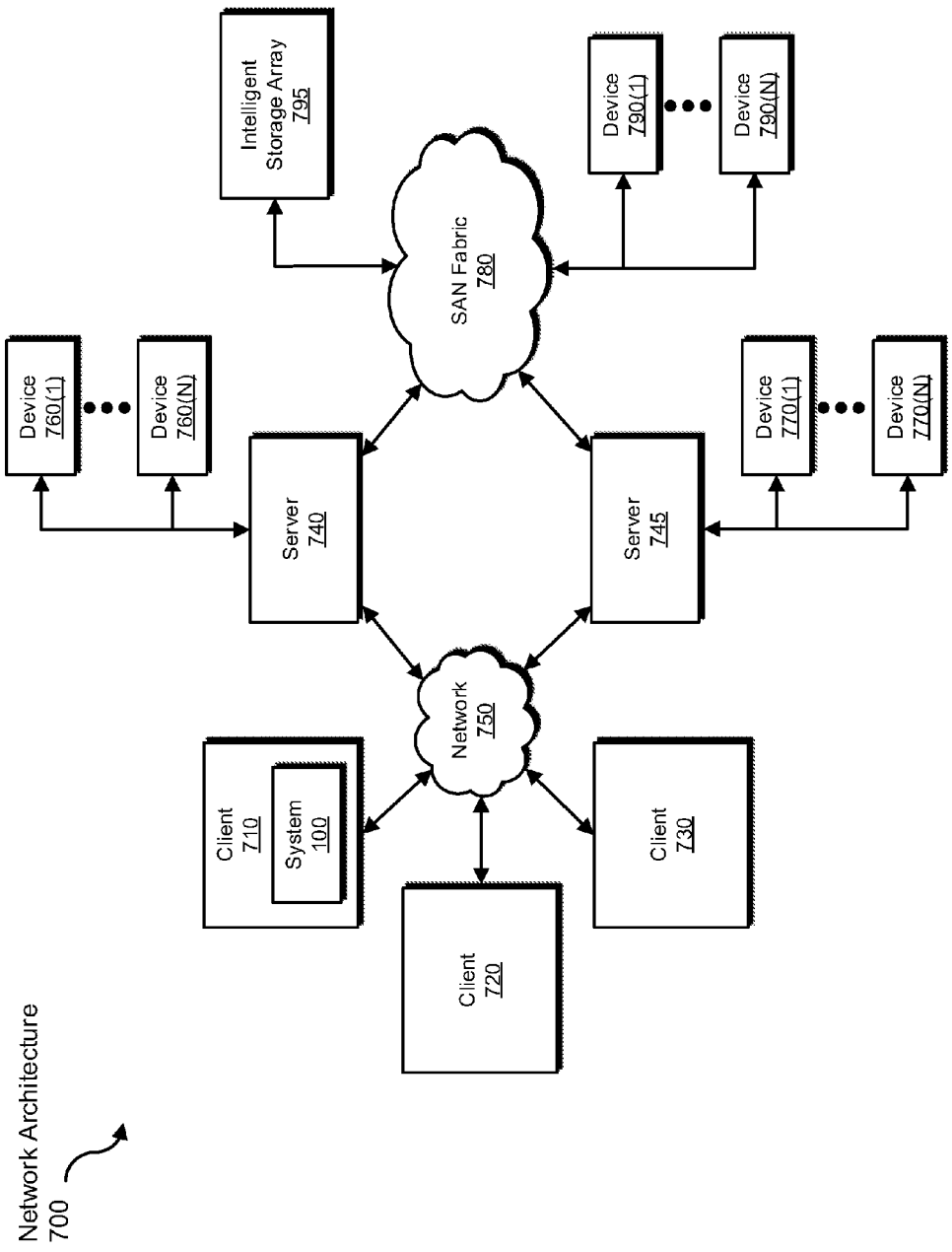
Network Architecture
700
Client
720
Client
710
System
100
Client
730
Network
750
Server
740
Server
745
Device
760(1)
Device
760(N)
Device
770(1)
Device
770(N)
SAN Fabric
780
Intelligent
Storage Array
795
Device
790(1)
Device
790(N)

FIG. 7

SYSTEMS AND METHODS FOR ENFORCING DATA LOSS PREVENTION POLICIES ON MOBILE DEVICES

BACKGROUND

Corporate networks are often filled with sensitive data in the form of confidential emails, company-private documents, personally identifying information, financial information, and more. The sensitive data may be spread across dozens or even hundreds of servers and/or personal computers. Ensuring that this data is kept secure may be very important for both a company's reputation and for its success. Companies may have data loss prevention ("DLP") policies to ensure that sensitive data is handled correctly. Now that sensitive data can be stored not only on devices on the company's intranet but also on the mobile devices of company employees, enforcing DLP policies has become more difficult than ever.

Many traditional systems for enforcing DLP may not be designed with mobile devices in mind. Some traditional systems that do apply to mobile devices may have problems enforcing DLP policies in real-time due to the need to check with a server whenever an action triggering a DLP policy decision takes place. Other traditional systems may be constrained by the limitations of mobile devices which may have limited amounts of processing power and/or battery charge. Accordingly, the instant disclosure identifies and addresses a need for additional and improved systems and methods for enforcing data loss prevention policies on mobile devices.

SUMMARY

As will be described in greater detail below, the instant disclosure generally relates to systems and methods for enforcing data loss prevention policies on mobile devices by identifying a mobile device with sensitive data that may be on a network and/or charging, requesting and receiving a data loss prevention category for the sensitive data, tagging the sensitive data based on the data loss prevention category, and enforcing a data loss prevention rule based on the tag.

In one example, a computer-implemented method for enforcing data loss prevention policies on mobile devices may include (1) identifying a mobile device that may be connected to a network and that may include sensitive data and that may be in a predetermined state that may be designated for transferring data for data loss prevention analysis, (2) requesting, from a data loss prevention policy database via the network, a data loss prevention policy category for the sensitive data on the mobile device based on an analysis of at least a portion of the sensitive data at the data loss prevention policy database, (3) receiving, from the data loss prevention policy database via the network, the data loss prevention policy category for the sensitive data on the mobile device, (4) tagging, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag, and (5) enforcing on the mobile device, based on the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data.

In one embodiment, the computer-implemented method may further include (1) performing, at the data loss prevention policy database, the analysis of the portion of the sensitive data and (2) determining, based on the analysis, the data loss prevention policy category for the sensitive data.

In some examples, the computer-implemented method may further include expiring the data loss prevention policy tag after a predetermined time span.

In one embodiment, the predetermined state may include a charging state.

In one embodiment, the network may include a predetermined type of network that may be designated for transferring data for data loss prevention analysis.

In some examples, enforcing the data loss prevention rule may include enforcing the data loss prevention rule when the mobile device may be not connected to the network.

In some examples, enforcing the data loss prevention rule may include (1) identifying an attempt to transfer the sensitive data and (2) preventing the attempt to transfer the sensitive data without communicating with the data loss prevention policy database after identifying the attempt and before preventing the attempt. In some examples, enforcing the data loss prevention rule may include (1) identifying an attempt to read the sensitive data and (2) blocking the attempt to read the sensitive data without communicating with the data loss prevention policy database after identifying the attempt and before preventing the attempt. In some examples, enforcing the data loss prevention rule may include allowing access to the sensitive data.

In one embodiment, a system for implementing the above-described method may include (1) an identification module that identifies a mobile device that may be connected to a network and that may include sensitive data and that may be in a predetermined state that may be designated for transferring data for data loss prevention analysis, (2) a request module that requests, from a data loss prevention policy database via the network, a data loss prevention policy category for the sensitive data on the mobile device based on an analysis of at least a portion of the sensitive data at the data loss prevention policy database, (3) a receiving module that receives, from the data loss prevention policy database via the network, the data loss prevention policy category for the sensitive data on the mobile device, (4) a tagging module that tags, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag, (5) an enforcing module that enforces on the mobile device, based on the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data, and (6) at least one processor configured to execute the identification module, the request module, the receiving module, the tagging module and the enforcing module.

In some examples, the above-described method may be encoded as computer-readable instructions on a computer-readable-storage medium. For example, a computer-readable-storage medium may include one or more computer-executable instructions that, when executed by at least one processor of a computing device, may cause the computing device to (1) identify a mobile device that is connected to a network and that includes sensitive data and that is in a predetermined state that is designated for transferring data for data loss prevention analysis, (2) request, from a data loss prevention policy database via the network, a data loss prevention policy category for the sensitive data on the mobile device based on an analysis of at least a portion of the sensitive data at the data loss prevention policy database, (3) receive, from the data loss prevention policy database via the network, the data loss prevention policy category for the sensitive data on the mobile device, (4) tag, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag, and (5) enforce on the mobile device, based on the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data.

Features from any of the above-mentioned embodiments may be used in combination with one another in accordance

with the general principles described herein. These and other embodiments, features, and advantages will be more fully understood upon reading the following detailed description in conjunction with the accompanying drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate a number of exemplary embodiments and are a part of the specification. Together with the following description, these drawings demonstrate and explain various principles of the instant disclosure.

FIG. **1** is a block diagram of an exemplary system for enforcing data loss prevention policies on mobile devices.

FIG. **2** is a block diagram of an exemplary system for enforcing data loss prevention policies on mobile devices.

FIG. **3** is a flow diagram of an exemplary method for enforcing data loss prevention policies on mobile devices.

FIG. **4** is a block diagram of an exemplary system for enforcing data loss prevention policies on mobile devices.

FIG. **5** is a flow diagram of an exemplary system for enforcing data loss prevention policies on mobile devices.

FIG. **6** is a block diagram of an exemplary computing system capable of implementing one or more of the embodiments described and/or illustrated herein.

FIG. **7** is a block diagram of an exemplary computing network capable of implementing one or more of the embodiments described and/or illustrated herein.

Throughout the drawings, identical reference characters and descriptions indicate similar, but not necessarily identical, elements. While the exemplary embodiments described herein are susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and will be described in detail herein. However, the exemplary embodiments described herein are not intended to be limited to the particular forms disclosed. Rather, the instant disclosure covers all modifications, equivalents and alternatives falling within the scope of the appended claims.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

The present disclosure is generally directed to systems and methods for enforcing data loss prevention policies on mobile devices. As will be explained in greater detail below, tagging sensitive data on a mobile device and enforcing DLP rules based on the tags may allow for highly accurate real-time DLP enforcement by eliminating the need to reference a database on demand. Systems described herein may also save power by performing the tagging process while the mobile device may be charging.

The following will provide, with reference to FIGS. **1-2** and **4**, detailed descriptions of exemplary systems for enforcing data loss prevention policies on mobile devices. Detailed descriptions of corresponding computer-implemented methods will also be provided in connection with FIGS. **3** and **5**. In addition, detailed descriptions of an exemplary computing system and network architecture capable of implementing one or more of the embodiments described herein will be provided in connection with FIGS. **6** and **7**, respectively.

FIG. **1** is a block diagram of exemplary system **100** for enforcing data loss prevention policies on mobile devices. As illustrated in this figure, exemplary system **100** may include one or more modules **102** for performing one or more tasks. For example, and as will be explained in greater detail below, exemplary system **100** may also include an identification module **104** that may identify a mobile device that may be connected to a network and that may include sensitive data and that may be in a predetermined state that may be designated for transferring data for data loss prevention analysis. Exemplary system **100** may additionally include a request module **106** that may request, from a database **120** via the network, a data loss prevention policy category for the sensitive data on the mobile device based on an analysis of at least a portion of the sensitive data at database **120**. Exemplary system **100** may also include a receiving module **108** that may receive, from database **120** via the network, the data loss prevention policy category for the sensitive data on the mobile device. Exemplary system **100** may additionally include a tagging module **110** that may tag, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag. Exemplary system **100** may also include an enforcing module **112** that may enforce on the mobile device, based on the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data. Although illustrated as separate elements, one or more of modules **102** in FIG. **1** may represent portions of a single module or application.

In certain embodiments, one or more of modules **102** in FIG. **1** may represent one or more software applications or programs that, when executed by a computing device, may cause the computing device to perform one or more tasks. For example, and as will be described in greater detail below, one or more of modules **102** may represent software modules stored and configured to run on one or more computing devices, such as the devices illustrated in FIG. **2** (e.g., computing device **202** and/or server **206**), computing system **610** in FIG. **6**, and/or portions of exemplary network architecture **700** in FIG. **7**. One or more of modules **102** in FIG. **1** may also represent all or portions of one or more special-purpose computers configured to perform one or more tasks.

As illustrated in FIG. **1**, exemplary system **100** may also include one or more databases, such as database **120**. In one example, database **120** may be configured to store data loss prevention policy information.

Database **120** may represent portions of a single database or computing device or a plurality of databases or computing devices. For example, database **120** may represent a portion of server **206** in FIG. **2**, computing system **610** in FIG. **6**, and/or portions of exemplary network architecture **700** in FIG. **7**. Alternatively, database **120** in FIG. **1** may represent one or more physically separate devices capable of being accessed by a computing device, such as server **206** in FIG. **2**, computing system **610** in FIG. **6**, and/or portions of exemplary network architecture **700** in FIG. **7**.

Exemplary system **100** in FIG. **1** may be implemented in a variety of ways. For example, all or a portion of exemplary system **100** may represent portions of exemplary system **200** in FIG. **2**. As shown in FIG. **2**, system **200** may include a computing device **202** in communication with a server **206** via a network **204**. Computing device **202** may be programmed with one or more of modules **102** and/or may store all or a portion of the data in database **120**. Additionally or alternatively, server **206** may be programmed with one or more of modules **102** and/or may store all or a portion of the data in database **120**.

In one embodiment, one or more of modules **102** from FIG. **1** may, when executed by at least one processor of computing device **202** and/or server **206**, facilitate computing device **202** and/or server **206** in enforcing data loss prevention policies on mobile devices. For example, and as will be described in greater detail below, one or more of modules **102** may cause

computing device **202** and/or server **206** to enforcing data loss prevention policies on mobile devices. For example, and as will be described in greater detail below, identification module **104** may be programmed to identify a mobile device (e.g., computing device **202**) that may be connected to network **204** and that may include sensitive data **208** and that may be in a predetermined state that may be designated for transferring data for data loss prevention analysis. Request module **106** may be programmed to request, from a database **120** via network **204**, a data loss prevention policy category for sensitive data **208** on the mobile device based on an analysis of at least a portion of sensitive data **208** at database **120**. Receiving module **108** may be programmed to receive, from database **120** via network **204**, DLP policy category **210** for sensitive data **208** on the mobile device. Tagging module **110** may be programmed to tag, based on DLP policy category **210**, sensitive data **208** on the mobile device with DLP policy tag **214**. Enforcing module **112** may be programmed to enforce on computing device **202**, based on DLP policy tag **212**, DLP rule **214** for DLP category **210** of sensitive data **208**.

Computing device **202** generally represents any type or form of computing device capable of reading computer-executable instructions. Examples of computing device **202** include, without limitation, laptops, tablets, desktops, servers, cellular phones, Personal Digital Assistants (PDAs), multimedia players, embedded systems, combinations of one or more of the same, exemplary computing system **610** in FIG. **6**, or any other suitable computing device.

Server **206** generally represents any type or form of computing device that may be capable of storing and/or processing data loss prevention policy information. Examples of server **206** include, without limitation, application servers and database servers configured to provide various database services and/or run certain software applications.

Network **204** generally represents any medium or architecture capable of facilitating communication or data transfer. Examples of network **204** include, without limitation, an intranet, a wireless local area network (WLAN), a Wide Area Network (WAN), a Local Area Network (LAN), a Personal Area Network (PAN), the Internet, Power Line Communications (PLC), a cellular network (e.g., a Global System for Mobile Communications (GSM) network), exemplary network architecture **700** in FIG. **7**, or the like. Network **204** may facilitate communication or data transfer using wireless or wired connections. In one embodiment, network **204** may facilitate communication between computing device **202** and server **206**.

FIG. **3** is a flow diagram of an exemplary computer-implemented method **300** for enforcing data loss prevention policies on mobile devices. The steps shown in FIG. **3** may be performed by any suitable computer-executable code and/or computing system. In some embodiments, the steps shown in FIG. **3** may be performed by one or more of the components of system **100** in FIG. **1**, system **200** in FIG. **2**, computing system **610** in FIG. **6**, and/or portions of exemplary network architecture **700** in FIG. **7**.

As illustrated in FIG. **3**, at step **302** one or more of the systems described herein may identify a mobile device that is connected to a network and that may include sensitive data and that is in a predetermined state that is designated for transferring data for data loss prevention analysis. For example, at step **302** identification module **104** may, as part of computing device **202** in FIG. **2**, identify a mobile device that is connected to a network **204** and that may include sensitive data **208** and that is in a predetermined state that is designated for transferring data for data loss prevention analysis.

Identification module **104** may identify the mobile device in any of a variety of contexts. For example, identification module **104** may identify a mobile device that may be connected to a wireless network and may be charging. In this example, the mobile device may be storing sensitive data that may be subject to a company's DLP policy.

In one example, identification module **104** may identify a smartphone that may be attached to a charger and may be on a company private Wi-Fi network. The smartphone may have company confidential files, such as documents including the credit card information of customers.

Identification module **104** may identify the mobile device in any suitable manner. For example, identification module **104** may identify the mobile device by executing on the mobile device. Additionally or alternatively, identification module **104** may identify the mobile device by identifying one or more files on the mobile device subject to data loss prevention and/or potentially subject to one or more data loss prevention policies and/or rules.

As used herein, the phrase "data loss prevention" generally refers to any system designed to detect and/or prevent potential data breaches. DLP systems may act on data which may be in use, in motion, and/or at rest. DLP systems may include policies about the storage and/or transmission of data, software configured to enforce DLP policies, physical enforcement of DLP policies, and/or hardware modifications that may prevent the transmission of data. Examples of DLP policies may include, without limitation, "financial information may not be accessed on mobile devices," "company private data may not be copied to movable storage media," "personally identifying information may not be emailed," and/or "all confidential data must be encrypted." Examples of DLP enforcement may include, without limitation, preventing write requests to portable storage media, filtering outgoing emails to detect sensitive data, preventing access to sensitive data while devices are on unsecured networks, and/or encrypting data on computing devices.

In some examples, the predetermined state may include a state of charging. Examples of a charging state may include, without limitation, connection to a mobile device charger, connection to a personal computing device, connection to a wall outlet, and/or inductive coupling with an inductive charging device. In some examples, the charging state may include a state of full charge and in which the mobile devices draws power from a source other than a primary battery of the mobile device. For example, systems described herein may continue to perform the described steps even if the device may have completed charging and may have a full battery. In some examples, the predetermined state may include a state of being attached to a predetermined type of network.

In some examples, the network may include a predetermined type of network that may be designated for transferring data for data loss prevention analysis. The predetermined type of network may include any of a variety of network types and/or characteristics. For example, the predetermined type of network may include a network with a large bandwidth (e.g., a LAN connection rather than a mobile data network) and/or a network with high or no data usage caps. In some examples, identification module **104** may identify that the network is the predetermined type of network based at least in part on a connection type to the network. For example, identification module **104** may determine that a Wi-Fi connection, a USB connection, and/or a BLUETOOTH connection to a network includes and/or is more likely to represent the predetermined type of network as opposed to a mobile telecommunications network (e.g., a 3G connection). For example,

the network may be a company intranet that the mobile device may connect to via a wireless network connection.

At step **304** one or more of the systems described herein may request, from a data loss prevention policy database via the network, a data loss prevention policy category for the sensitive data on the mobile device based on an analysis of at least a portion of the sensitive data at the data loss prevention policy database. For example, at step **304** request module **106** may, as part of computing device **202** in FIG. **2**, request, from a database **120** via network **204**, a data loss prevention policy category (e.g., DLP policy category) for sensitive data **208** on the mobile device based on an analysis of at least a portion of sensitive data **208** at the database **120**.

Request module **106** may request the DLP category in any of a variety of ways. For example, request module **106** may request a DLP category by sending a portion of the sensitive data on the mobile device to a DLP policy database via a wireless network. In one example, request module **106** may use the Wi-Fi network to send the sensitive files on the smartphone to a DLP policy database for categorization. In one example, request module **106** may use the Wi-Fi network to send the file names and metadata of the sensitive files to a DLP policy database for categorization.

In some examples, request module **106** may send the entirety of the sensitive data to the DLP policy database. In some examples, request module **106** may send a portion of the sensitive data. For example, request module **106** may send the file name, file headers, a portion of the contents of the file, and/or a hash representing the file to the DLP policy database.

In some embodiments, systems described herein may perform, at the data loss prevention policy database, the analysis of the portion of the sensitive data, and/or determine, based on the analysis, the data loss prevention policy category for the sensitive data. For example, the DLP database may run a regular expression against the sensitive data and may categorize the data based on whether or not it matches the regular expression. In another example, the DLP database may examine the structure of the sensitive data to determine the category. In one example, the DLP database may search the sensitive data for a particular string or set of strings in order to categorize the sensitive data.

At step **306** one or more of the systems described herein may receive, from the data loss prevention policy database via the network, the data loss prevention policy category for the sensitive data on the mobile device. For example, at step **306** receiving module **108** may, as part of computing device **202** in FIG. **2**, receive, from the database **120** via network **204**, DLP policy category **210** for sensitive data **208** on the mobile device.

Receiving module **108** may receive the DLP category in any suitable manner. For example, receiving module **108** may receive, via the wireless network, the DLP category for the sensitive data from the DLP policy database. In some examples, the DLP category may be based on the data type of the data. Examples of data types include, without limitation, credit card information, company-private information, confidential information, personally identifying information, and/or trade secrets. In some examples, the DLP category may be based on the type of risk caused by potential loss of the data. Examples of types of risk include but are not limited to identity theft, fraud, corporate espionage and/or breaches of confidentiality. In some examples, the DLP category may be based on the DLP rule for the data. Examples of DLP rules include, without limitation, "do not transmit," "do not write to portable storage media," and/or "do not read."

In some examples, receiving module **108** may receive multiple categories for the sensitive flies. The sensitive files may fall under multiple different DLP rules, and/or may include multiple types of sensitive data. For example, the sensitive files may have categories "personally identifying information" and/or "financial information."

In one example, receiving module **108** may receive the category "identity theft risk" for the sensitive files including credit card information. The smartphone may receive the category from the DLP policy database via the Wi-Fi. Additionally or alternatively, receiving module **108** may receive the category "do not transmit" for the sensitive files including credit card information. The smartphone may receive the category from the DLP policy database via the Wi-Fi.

At step **308** one or more of the systems described herein may tag, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag. For example, at step **308** tagging module **110** may, as part of computing device **202** in FIG. **2**, tag, based on DLP policy category **210**, sensitive data **208** on computing device **202** with DLP policy tag **212**.

Tagging module **110** may tag the sensitive data in any suitable manner. For example, tagging module **110** may tag the sensitive data on the mobile device with a tag determined by the DLP category received from the DLP policy database.

In one example, tagging module **110** may tag the documents including credit card data with the tag "identity theft risk" based on the category "identity theft risk." As another example, tagging module **110** may tag the documents including credit card data with the tag "do not transmit" based on the category "do not transmit." In an additional example, tagging module **110** may tag the documents including credit card data with the tag "credit card data" based on the category "credit card data."

In some examples, the tag may be different than the category. For example, tagging module **110** may tag the sensitive data with the tag "identity theft risk" based on the category "credit card information." In one example, tagging module **110** may tag the sensitive data with the tag "do not transmit" based on the category "identity theft risk."

FIG. **4** is a block diagram of an exemplary computing system **400** for enforcing data loss prevention policies on mobile devices. DLP policy database **420** may include DLP policy **406**. DLP policy **406** may apply categories **409**, **413** and/or **415** to sensitive data **408**, proprietary document **412**, and/or archived emails **414**, respectively. Based on these categories, mobile device **402** may apply tags **418**, **422** and/or **424** to sensitive data **408**, proprietary document **412**, and/or archived emails **414**, respectively. Based on tags **418**, **422** and/or **424**, systems described herein may enforce DLP rules **419**, **423** and/or **425**, respectively, on sensitive data **408**, proprietary document **412**, and/or archived emails **414**.

For example, the DLP policy database may include a DLP policy that may include the rules, "sensitive data may not be transmitted," "proprietary documents must be encrypted," and/or "archived emails have no restrictions." The DLP policy database may categorize the sensitive data, proprietary document, and/or archived emails from the mobile device as "sensitive data," "no restrictions," and/or "proprietary data." The DLP database may send these categories to the mobile device. The mobile device may tag the sensitive data, proprietary document, and/or archived emails, respectively, as "sensitive," "proprietary," and/or "unrestricted." The mobile device may then enforce the DLP rules "do not transmit," "do not unencrypt," and/or "no restrictions" on the sensitive data, proprietary document, and/or archived emails, respectively, based on the tags.

Returning to FIG. **3**, at step **310** one or more of the systems described herein may enforce on the mobile device, based on

the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data. For example, at step **310** enforcing module **112** may, as part of computing device **202** in FIG. **2**, enforce on computing device **202**, based on DLP policy tag **212**, DLP rule **214** for DLP category **210** of sensitive data **208**.

Enforcing module **112** may enforce the data loss prevention rule in any suitable manner. For example, enforcing module **112** may enforce a DLP rule on the sensitive data on the mobile device in reaction to a user attempting an action in relation to the data.

In one example, enforcing module **112** may detect that a user may be attempting to email the documents containing credit card information. The smartphone may include a DLP policy which may interpret the tag "identity theft risk" to mean that the documents may not be transmitted, and may enforce a DLP rule preventing the user from emailing the documents.

In one example, enforcing module **112** may detect that a user may be attempting to email the documents containing credit card information. The smartphone may prevent the user from emailing the documents by enforcing a DLP rule based on the tag "do not transmit" on the document.

In some examples, enforcing module **112** may enforce the data loss prevention rule by enforcing the data loss prevention rule when the mobile device may not be connected to the network. For example, a user may attempt to read a file tagged "read disallowed" while not connected to any network. Because the tag may already be in place, systems described herein may not require network access in order to enforce the DLP policy and prevent read access to the file. In some examples, the mobile device may be connected to a network which may not be the network which has access to the DLP policy database. For example, a user may attempt to email a sensitive document while on a public wireless network and may be prevented from doing so based on the tag on the sensitive document.

In some examples, enforcing module **112** may enforce the data loss prevention rule by identifying an attempt to transfer the sensitive data and/or preventing the attempt to transfer the sensitive data. For example, a user may attempt to email a company confidential document from their mobile device. Systems described herein may identify that the document has been tagged as "company confidential," determine that the proper treatment for that tag may involve blocking transfers of the document, and may block the sending of the email. In some examples, enforcing module **112** may enforce the data loss prevention rule without communicating with the data loss prevention policy database after identifying the attempt and before preventing the attempt. In this manner, enforcing module **112** may act on the attempt while minimizing the latency of the transfer attempt, the impact on mobile device performance, and a reliance on the current state of the mobile device (e.g., connectivity to a suitable network).

In some examples, enforcing module **112** may enforce the data loss prevention rule by identifying an attempt to read the sensitive data and/or blocking the attempt to read the sensitive data. For example, a user may attempt to decrypt sensitive data on their mobile device which may have been tagged as "no read allowed." Systems described herein may identify this attempt and may prevent the decryption of the sensitive data based on the tag. In some examples, enforcing module **112** may enforce the data loss prevention rule without communicating with the data loss prevention policy database after identifying the attempt and before preventing the attempt. In this manner, enforcing module **112** may act on the attempt while minimizing the latency of the read attempt, the impact on mobile device performance, and a reliance on the current state of the mobile device.

In some examples, enforcing module **112** may enforce the data loss prevention rule by allowing access to the sensitive data. For example, a user may attempt to open a document which may be tagged as "allow read; disallow transfer." Systems described herein may identify the read attempt and may allow the read attempt based on the tag. In some examples, enforcing module **112** may enforce the data loss prevention rule without communicating with the data loss prevention policy database after identifying the access attempt and before preventing the attempt. In this manner, enforcing module **112** may act on the attempt while minimizing the latency of the access attempt, the impact on mobile device performance, and a reliance on the current state of the mobile device.

In some embodiments, systems described herein may expire the data loss prevention policy tag after a predetermined time span. Examples of a predetermined time span may include one day, one week, and/or one month. Additionally or alternatively, these systems may expire the data loss prevention policy tag by receiving a notification from the data loss prevention policy database that certain tags have expired. In some examples, the systems described herein may replace the expired tags with new tags (e.g., by querying the data loss prevention policy database again). For example, the tag "do not transmit" may be expired and replaced with the tag "transmission allowed" if the DLP policy for the category of sensitive data has changed. In another example, the tag "no risk" may be expired and replaced with the tag "NDA violation risk" if the system used to categorize the sensitive data has been changed to include additional categories and/or recognize more examples of data from existing categories. In one example, the tag "personal contact information" may be expired and not replaced because the data loss prevention database has been updated with a more accurate parsing method for identifying personal contact information in files (and, e.g., the file to which the tag had previously been applied did not contain personal contact information). In some examples, expired tags may be replaced with identical tags.

FIG. **5** is a flow diagram of an exemplary method **500** for enforcing data loss prevention policies on mobile devices. Using FIG. **5** as an example, a user may, at step **502**, take an action involving potentially sensitive data on a mobile device. At step **504**, systems described herein may examine a tag on the potentially sensitive data. In one example, at step **506**(*a*), these systems may determine that the tag describes the data as "no risk." In this example, at step **508**(*a*), these systems may identify a corresponding DLP rule to allow all actions on the data. In one example, at step **506**(*b*), these systems may determine that the tag describes the data as "identity theft risk." In this example, if the action is a read action, at step **508**(*b*)(**1**) these systems may identify a corresponding DLP rule to allow the action. If the action is a transmission of the sensitive data, at step **508**(*b*)(**2**) these systems may identify a corresponding DLP rule to block the transaction. In one example, at step **506**(*c*), these systems may determine that the tag describes the data as "corporate confidentiality risk." In this example, at step **508**(*c*), these systems may identify a corresponding DLP rule to deny all actions that may be taken involving the sensitive data.

As explained above in connection with method **300** in FIG. **3**, systems described herein may identify a mobile device with sensitive data that may be on a network and in a state designated for DLP analysis. The designated state may

include being in the process of charging, which may remove the constraint of limited mobile device batteries. The network may be of a predetermined type, such as a private corporate network. The mobile device may request a DLP category for the sensitive data from a DLP policy database on the network. The DLP policy database may perform an analysis of the sensitive data and send a category for the sensitive data to the mobile device.

The mobile device may tag the sensitive data on the mobile device based on the DLP category received from the DLP database. Systems described herein may enforce, on the mobile device, the DLP policy based on the tags. This may happen at any time after the sensitive data has been tagged, including situations when the mobile device may not be connected to a network. The enforcement of the DLP policy may include blocking and/or allowing reads and/or transfers of the sensitive data, based on the tag. The tag allows for accurate, real-time DLP policy decisions to be made in regard to the sensitive data without requiring the mobile device to be connected to the DLP policy database.

FIG. **6** is a block diagram of an exemplary computing system **610** capable of implementing one or more of the embodiments described and/or illustrated herein. For example, all or a portion of computing system **610** may perform and/or be a means for performing, either alone or in combination with other elements, one or more of the steps described herein (such as one or more of the steps illustrated in FIG. **3**). All or a portion of computing system **610** may also perform and/or be a means for performing any other steps, methods, or processes described and/or illustrated herein.

Computing system **610** broadly represents any single or multi-processor computing device or system capable of executing computer-readable instructions. Examples of computing system **610** include, without limitation, workstations, laptops, client-side terminals, servers, distributed computing systems, handheld devices, or any other computing system or device. In its most basic configuration, computing system **610** may include at least one processor **614** and a system memory **616**.

Processor **614** generally represents any type or form of processing unit capable of processing data or interpreting and executing instructions. In certain embodiments, processor **614** may receive instructions from a software application or module. These instructions may cause processor **614** to perform the functions of one or more of the exemplary embodiments described and/or illustrated herein.

System memory **616** generally represents any type or form of volatile or non-volatile storage device or medium capable of storing data and/or other computer-readable instructions. Examples of system memory **616** include, without limitation, Random Access Memory (RAM), Read Only Memory (ROM), flash memory, or any other suitable memory device. Although not required, in certain embodiments computing system **610** may include both a volatile memory unit (such as, for example, system memory **616**) and a non-volatile storage device (such as, for example, primary storage device **632**, as described in detail below). In one example, one or more of modules **102** from FIG. **1** may be loaded into system memory **616**.

In certain embodiments, exemplary computing system **610** may also include one or more components or elements in addition to processor **614** and system memory **616**. For example, as illustrated in FIG. **6**, computing system **610** may include a memory controller **618**, an Input/Output (I/O) controller **620**, and a communication interface **622**, each of which may be interconnected via a communication infrastructure **612**. Communication infrastructure **612** generally represents any type or form of infrastructure capable of facilitating communication between one or more components of a computing device. Examples of communication infrastructure **612** include, without limitation, a communication bus (such as an Industry Standard Architecture (ISA), Peripheral Component Interconnect (PCI), PCI Express (PCIe), or similar bus) and a network.

Memory controller **618** generally represents any type or form of device capable of handling memory or data or controlling communication between one or more components of computing system **610**. For example, in certain embodiments memory controller **618** may control communication between processor **614**, system memory **616**, and I/O controller **620** via communication infrastructure **612**.

I/O controller **620** generally represents any type or form of module capable of coordinating and/or controlling the input and output functions of a computing device. For example, in certain embodiments I/O controller **620** may control or facilitate transfer of data between one or more elements of computing system **610**, such as processor **614**, system memory **616**, communication interface **622**, display adapter **626**, input interface **630**, and storage interface **634**.

Communication interface **622** broadly represents any type or form of communication device or adapter capable of facilitating communication between exemplary computing system **610** and one or more additional devices. For example, in certain embodiments communication interface **622** may facilitate communication between computing system **610** and a private or public network including additional computing systems. Examples of communication interface **622** include, without limitation, a wired network interface (such as a network interface card), a wireless network interface (such as a wireless network interface card), a modem, and any other suitable interface. In at least one embodiment, communication interface **622** may provide a direct connection to a remote server via a direct link to a network, such as the Internet. Communication interface **622** may also indirectly provide such a connection through, for example, a local area network (such as an Ethernet network), a personal area network, a telephone or cable network, a cellular telephone connection, a satellite data connection, or any other suitable connection.

In certain embodiments, communication interface **622** may also represent a host adapter configured to facilitate communication between computing system **610** and one or more additional network or storage devices via an external bus or communications channel. Examples of host adapters include, without limitation, Small Computer System Interface (SCSI) host adapters, Universal Serial Bus (USB) host adapters, Institute of Electrical and Electronics Engineers (IEEE) 1394 host adapters, Advanced Technology Attachment (ATA), Parallel ATA (PATA), Serial ATA (SATA), and External SATA (eSATA) host adapters, Fibre Channel interface adapters, Ethernet adapters, or the like. Communication interface **622** may also allow computing system **610** to engage in distributed or remote computing. For example, communication interface **622** may receive instructions from a remote device or send instructions to a remote device for execution.

As illustrated in FIG. **6**, computing system **610** may also include at least one display device **624** coupled to communication infrastructure **612** via a display adapter **626**. Display device **624** generally represents any type or form of device capable of visually displaying information forwarded by display adapter **626**. Similarly, display adapter **626** generally represents any type or form of device configured to forward graphics, text, and other data from communication infrastruc-

ture **612** (or from a frame buffer, as known in the art) for display on display device **624**.

As illustrated in FIG. **6**, exemplary computing system **610** may also include at least one input device **628** coupled to communication infrastructure **612** via an input interface **630**. Input device **628** generally represents any type or form of input device capable of providing input, either computer or human generated, to exemplary computing system **610**. Examples of input device **628** include, without limitation, a keyboard, a pointing device, a speech recognition device, or any other input device.

As illustrated in FIG. **6**, exemplary computing system **610** may also include a primary storage device **632** and a backup storage device **633** coupled to communication infrastructure **612** via a storage interface **634**. Storage devices **632** and **633** generally represent any type or form of storage device or medium capable of storing data and/or other computer-readable instructions. For example, storage devices **632** and **633** may be a magnetic disk drive (e.g., a so-called hard drive), a solid state drive, a floppy disk drive, a magnetic tape drive, an optical disk drive, a flash drive, or the like. Storage interface **634** generally represents any type or form of interface or device for transferring data between storage devices **632** and **633** and other components of computing system **610**. In one example, database **120** from FIG. **1** may be stored in primary storage device **632**.

In certain embodiments, storage devices **632** and **633** may be configured to read from and/or write to a removable storage unit configured to store computer software, data, or other computer-readable information. Examples of suitable removable storage units include, without limitation, a floppy disk, a magnetic tape, an optical disk, a flash memory device, or the like. Storage devices **632** and **633** may also include other similar structures or devices for allowing computer software, data, or other computer-readable instructions to be loaded into computing system **610**. For example, storage devices **632** and **633** may be configured to read and write software, data, or other computer-readable information. Storage devices **632** and **633** may also be a part of computing system **610** or may be a separate device accessed through other interface systems.

Many other devices or subsystems may be connected to computing system **610**. Conversely, all of the components and devices illustrated in FIG. **6** need not be present to practice the embodiments described and/or illustrated herein. The devices and subsystems referenced above may also be interconnected in different ways from that shown in FIG. **6**. Computing system **610** may also employ any number of software, firmware, and/or hardware configurations. For example, one or more of the exemplary embodiments disclosed herein may be encoded as a computer program (also referred to as computer software, software applications, computer-readable instructions, or computer control logic) on a computer-readable-storage medium. The phrase "computer-readable-storage medium" generally refers to any form of device, carrier, or medium capable of storing or carrying computer-readable instructions. Examples of computer-readable-storage media include, without limitation, transmission-type media, such as carrier waves, and non-transitory-type media, such as magnetic-storage media (e.g., hard disk drives and floppy disks), optical-storage media (e.g., Compact Disks (CDs) or Digital Video Disks (DVDs)), electronic-storage media (e.g., solid-state drives and flash media), and other distribution systems.

The computer-readable-storage medium containing the computer program may be loaded into computing system **610**. All or a portion of the computer program stored on the computer-readable-storage medium may then be stored in system memory **616** and/or various portions of storage devices **632** and **633**. When executed by processor **614**, a computer program loaded into computing system **610** may cause processor **614** to perform and/or be a means for performing the functions of one or more of the exemplary embodiments described and/or illustrated herein. Additionally or alternatively, one or more of the exemplary embodiments described and/or illustrated herein may be implemented in firmware and/or hardware. For example, computing system **610** may be configured as an Application Specific Integrated Circuit (ASIC) adapted to implement one or more of the exemplary embodiments disclosed herein.

FIG. **7** is a block diagram of an exemplary network architecture **700** in which client systems **710**, **720**, and **730** and servers **740** and **745** may be coupled to a network **750**. As detailed above, all or a portion of network architecture **700** may perform and/or be a means for performing, either alone or in combination with other elements, one or more of the steps disclosed herein (such as one or more of the steps illustrated in FIG. **3**). All or a portion of network architecture **700** may also be used to perform and/or be a means for performing other steps and features set forth in the instant disclosure.

Client systems **710**, **720**, and **730** generally represent any type or form of computing device or system, such as exemplary computing system **610** in FIG. **6**. Similarly, servers **740** and **745** generally represent computing devices or systems, such as application servers or database servers, configured to provide various database services and/or run certain software applications. Network **750** generally represents any telecommunication or computer network including, for example, an intranet, a WAN, a LAN, a PAN, or the Internet. In one example, client systems **710**, **720**, and/or **730** and/or servers **740** and/or **745** may include all or a portion of system **100** from FIG. **1**.

As illustrated in FIG. **7**, one or more storage devices **760**(**1**)-(N) may be directly attached to server **740**. Similarly, one or more storage devices **770**(**1**)-(N) may be directly attached to server **745**. Storage devices **760**(**1**)-(N) and storage devices **770**(**1**)-(N) generally represent any type or form of storage device or medium capable of storing data and/or other computer-readable instructions. In certain embodiments, storage devices **760**(**1**)-(N) and storage devices **770**(**1**)-(N) may represent Network-Attached Storage (NAS) devices configured to communicate with servers **740** and **745** using various protocols, such as Network File System (NFS), Server Message Block (SMB), or Common Internet File System (CIFS).

Servers **740** and **745** may also be connected to a Storage Area Network (SAN) fabric **780**. SAN fabric **780** generally represents any type or form of computer network or architecture capable of facilitating communication between a plurality of storage devices. SAN fabric **780** may facilitate communication between servers **740** and **745** and a plurality of storage devices **790**(**1**)-(N) and/or an intelligent storage array **795**. SAN fabric **780** may also facilitate, via network **750** and servers **740** and **745**, communication between client systems **710**, **720**, and **730** and storage devices **790**(**1**)-(N) and/or intelligent storage array **795** in such a manner that devices **790**(**1**)-(N) and array **795** appear as locally attached devices to client systems **710**, **720**, and **730**. As with storage devices **760**(**1**)-(N) and storage devices **770**(**1**)-(N), storage devices **790**(**1**)-(N) and intelligent storage array **795** generally represent any type or form of storage device or medium capable of storing data and/or other computer-readable instructions.

In certain embodiments, and with reference to exemplary computing system **610** of FIG. **6**, a communication interface, such as communication interface **622** in FIG. **6**, may be used

to provide connectivity between each client system **710**, **720**, and **730** and network **750**. Client systems **710**, **720**, and **730** may be able to access information on server **740** or **745** using, for example, a web browser or other client software. Such software may allow client systems **710**, **720**, and **730** to access data hosted by server **740**, server **745**, storage devices **760**(**1**)-(N), storage devices **770**(**1**)-(N), storage devices **790**(**1**)-(N), or intelligent storage array **795**. Although FIG. **7** depicts the use of a network (such as the Internet) for exchanging data, the embodiments described and/or illustrated herein are not limited to the Internet or any particular network-based environment.

In at least one embodiment, all or a portion of one or more of the exemplary embodiments disclosed herein may be encoded as a computer program and loaded onto and executed by server **740**, server **745**, storage devices **760**(**1**)-(N), storage devices **770**(**1**)-(N), storage devices **790**(**1**)-(N), intelligent storage array **795**, or any combination thereof. All or a portion of one or more of the exemplary embodiments disclosed herein may also be encoded as a computer program, stored in server **740**, run by server **745**, and distributed to client systems **710**, **720**, and **730** over network **750**.

As detailed above, computing system **610** and/or one or more components of network architecture **700** may perform and/or be a means for performing, either alone or in combination with other elements, one or more steps of an exemplary method for enforcing data loss prevention policies on mobile devices.

While the foregoing disclosure sets forth various embodiments using specific block diagrams, flowcharts, and examples, each block diagram component, flowchart step, operation, and/or component described and/or illustrated herein may be implemented, individually and/or collectively, using a wide range of hardware, software, or firmware (or any combination thereof) configurations. In addition, any disclosure of components contained within other components should be considered exemplary in nature since many other architectures can be implemented to achieve the same functionality.

In some examples, all or a portion of exemplary system **100** in FIG. **1** may represent portions of a cloud-computing or network-based environment. Cloud-computing environments may provide various services and applications via the Internet. These cloud-based services (e.g., software as a service, platform as a service, infrastructure as a service, etc.) may be accessible through a web browser or other remote interface. Various functions described herein may be provided through a remote desktop environment or any other cloud-based computing environment.

In various embodiments, all or a portion of exemplary system **100** in FIG. **1** may facilitate multi-tenancy within a cloud-based computing environment. In other words, the software modules described herein may configure a computing system (e.g., a server) to facilitate multi-tenancy for one or more of the functions described herein. For example, one or more of the software modules described herein may program a server to enable two or more clients (e.g., customers) to share an application that is running on the server. A server programmed in this manner may share an application, operating system, processing system, and/or storage system among multiple customers (i.e., tenants). One or more of the modules described herein may also partition data and/or configuration information of a multi-tenant application for each customer such that one customer cannot access data and/or configuration information of another customer.

According to various embodiments, all or a portion of exemplary system **100** in FIG. **1** may be implemented within a virtual environment. For example, modules and/or data described herein may reside and/or execute within a virtual machine. As used herein, the phrase "virtual machine" generally refers to any operating system environment that is abstracted from computing hardware by a virtual machine manager (e.g., a hypervisor). Additionally or alternatively, the modules and/or data described herein may reside and/or execute within a virtualization layer. As used herein, the phrase "virtualization layer" generally refers to any data layer and/or application layer that overlays and/or is abstracted from an operating system environment. A virtualization layer may be managed by a software virtualization solution (e.g., a file system filter) that presents the virtualization layer as though it were part of an underlying base operating system. For example, a software virtualization solution may redirect calls that are initially directed to locations within a base file system and/or registry to locations within a virtualization layer.

In some examples, all or a portion of exemplary system **100** in FIG. **1** may represent portions of a mobile computing environment. Mobile computing environments may be implemented by a wide range of mobile computing devices, including mobile phones, tablet computers, e-book readers, personal digital assistants, wearable computing devices (e.g., computing devices with a head-mounted display, smartwatches, etc.), and the like. In some examples, mobile computing environments may have one or more distinct features, including, for example, reliance on battery power, presenting only one foreground application at any given time, remote management features, touchscreen features, location and movement data (e.g., provided by Global Positioning Systems, gyroscopes, accelerometers, etc.), restricted platforms that restrict modifications to system-level configurations and/or that limit the ability of third-party software to inspect the behavior of other applications, controls to restrict the installation of applications (e.g., to only originate from approved application stores), etc. Various functions described herein may be provided for a mobile computing environment and/or may interact with a mobile computing environment.

In addition, all or a portion of exemplary system **100** in FIG. **1** may represent portions of, interact with, consume data produced by, and/or produce data consumed by one or more systems for information management. As used herein, the phrase "information management" may refer to the protection, organization, and/or storage of data. Examples of systems for information management may include, without limitation, storage systems, backup systems, archival systems, replication systems, high availability systems, data search systems, virtualization systems, and the like.

In some embodiments, all or a portion of exemplary system **100** in FIG. **1** may represent portions of, produce data protected by, and/or communicate with one or more systems for information security. As used herein, the phrase "information security" may refer to the control of access to protected data. Examples of systems for information security may include, without limitation, systems providing managed security services, data loss prevention systems, identity authentication systems, access control systems, encryption systems, policy compliance systems, intrusion detection and prevention systems, electronic discovery systems, and the like.

According to some examples, all or a portion of exemplary system **100** in FIG. **1** may represent portions of, communicate with, and/or receive protection from one or more systems for endpoint security. As used herein, the phrase "endpoint security" may refer to the protection of endpoint systems from unauthorized and/or illegitimate use, access, and/or control. Examples of systems for endpoint protection may include,

without limitation, anti-malware systems, user authentication systems, encryption systems, privacy systems, spam-filtering services, and the like.

The process parameters and sequence of steps described and/or illustrated herein are given by way of example only and can be varied as desired. For example, while the steps illustrated and/or described herein may be shown or discussed in a particular order, these steps do not necessarily need to be performed in the order illustrated or discussed. The various exemplary methods described and/or illustrated herein may also omit one or more of the steps described or illustrated herein or include additional steps in addition to those disclosed.

While various embodiments have been described and/or illustrated herein in the context of fully functional computing systems, one or more of these exemplary embodiments may be distributed as a program product in a variety of forms, regardless of the particular type of computer-readable-storage media used to actually carry out the distribution. The embodiments disclosed herein may also be implemented using software modules that perform certain tasks. These software modules may include script, batch, or other executable files that may be stored on a computer-readable storage medium or in a computing system. In some embodiments, these software modules may configure a computing system to perform one or more of the exemplary embodiments disclosed herein.

In addition, one or more of the modules described herein may transform data, physical devices, and/or representations of physical devices from one form to another. For example, one or more of the modules recited herein may receive sensitive to be transformed, transform the sensitive data, output a result of the transformation to data loss prevention policy database, use the result of the transformation to categorize the sensitive data, and store the result of the transformation to the data loss prevention policy database. Additionally or alternatively, one or more of the modules recited herein may transform a processor, volatile memory, non-volatile memory, and/or any other portion of a physical computing device from one form to another by executing on the computing device, storing data on the computing device, and/or otherwise interacting with the computing device.

The preceding description has been provided to enable others skilled in the art to best utilize various aspects of the exemplary embodiments disclosed herein. This exemplary description is not intended to be exhaustive or to be limited to any precise form disclosed. Many modifications and variations are possible without departing from the spirit and scope of the instant disclosure. The embodiments disclosed herein should be considered in all respects illustrative and not restrictive. Reference should be made to the appended claims and their equivalents in determining the scope of the instant disclosure.

Unless otherwise noted, the terms "a" or "an," as used in the specification and claims, are to be construed as meaning "at least one of." In addition, for ease of use, the words "including" and "having," as used in the specification and claims, are interchangeable with and have the same meaning as the word "comprising."

What is claimed is:

1. A computer-implemented method for enforcing data loss prevention policies on mobile devices, at least a portion of the method being performed by a computing device comprising at least one processor, the method comprising:

identifying a mobile device that is connected to a network and that comprises sensitive data and that is in a charging state in which the mobile device draws power from a source other than a primary battery of the mobile device;

requesting, from a data loss prevention policy database via the network, a data loss prevention policy category for the sensitive data on the mobile device based on an analysis of at least a portion of the sensitive data at the data loss prevention policy database, wherein the data loss prevention policy category indicates a type of risk caused by potential loss of the sensitive data;

receiving, from the data loss prevention policy database via the network, the data loss prevention policy category for the sensitive data on the mobile device;

tagging, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag;

determining that the mobile device is no longer connected to the network;

while the mobile device is not connected to the network, enforcing on the mobile device, based on the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data without communicating with the data loss prevention policy database.

2. The computer-implemented method of claim **1**, further comprising:

performing, at the data loss prevention policy database, the analysis of the portion of the sensitive data;

determining, based on the analysis, the data loss prevention policy category for the sensitive data.

3. The computer-implemented method of claim **1**, further comprising expiring the data loss prevention policy tag after a predetermined time span.

4. The computer-implemented method of claim **1**, wherein the network comprises a predetermined type of network that is designated for transferring data for data loss prevention analysis.

5. The computer-implemented method of claim **1**, wherein enforcing the data loss prevention rule comprises:

identifying an attempt to transfer the sensitive data;

preventing the attempt to transfer the sensitive data without communicating with the data loss prevention policy database after identifying the attempt and before preventing the attempt.

6. The computer-implemented method of claim **1**, wherein enforcing the data loss prevention rule comprises:

identifying an attempt to read the sensitive data;

blocking the attempt to read the sensitive data without communicating with the data loss prevention policy database after identifying the attempt and before preventing the attempt.

7. The computer-implemented method of claim **1**, wherein enforcing the data loss prevention rule comprises allowing access to the sensitive data.

8. A system for enforcing data loss prevention policies on mobile devices, the system comprising:

an identification module that identifies a mobile device that is connected to a network and that by sensitive data and that is in a charging state in which the mobile device draws power from a source other than a primary battery of the mobile device;

a request module that requests, from a data loss prevention policy database via the network, a data loss prevention policy category for the sensitive data on the mobile device based on an analysis of at least a portion of the sensitive data at the data loss prevention policy database,

wherein the data loss prevention policy category indicates a type of risk caused by potential loss of the sensitive data;

a receiving module that receives, from the data loss prevention policy database via the network, the data loss prevention policy category for the sensitive data on the mobile device;

a tagging module that tags, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag;

an enforcing module that:

determines that the mobile device is no longer connected to the network;

while the mobile device is not connected to the network, enforces on the mobile device, based on the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data without communicating with the data loss prevention policy database;

at least one hardware processor configured to execute the identification module, the request module, the receiving module, the tagging module and the enforcing module.

9. The system of claim **8**, further comprising:

a performing module that performs, at the data loss prevention policy database, the analysis of the portion of the sensitive data;

a determination module that determines, based on the analysis, the data loss prevention policy category for the sensitive data;

wherein the hardware processor is further configured to execute the performing module and the determination module.

10. The system of claim **8**, further comprising an expiring module that expires the data loss prevention policy tag after a predetermined time span;

wherein the hardware processor is further configured to execute the expiring module.

11. The system of claim **8**, wherein the network comprises a predetermined type of network that is designated for transferring data for data loss prevention analysis.

12. The system of claim **8**, wherein the enforcing module enforces the data loss prevention rule by:

identifying an attempt to transfer the sensitive data;

preventing the attempt to transfer the sensitive data without communicating with the data loss prevention policy database after identifying the attempt and before preventing the attempt.

13. A non-transitory computer-readable-storage medium comprising one or more computer-readable instructions that, when executed by at least one processor of a computing device, cause the computing device to:

identify a mobile device that is connected to a network and that comprises sensitive data and that is in a charging state in which the mobile device draws power from a source other than a primary battery of the mobile device;

request, from a data loss prevention policy database via the network, a data loss prevention policy category for the sensitive data on the mobile device based on an analysis of at least a portion of the sensitive data at the data loss prevention policy database, wherein the data loss prevention policy category indicates a type of risk caused by potential loss of the sensitive data;

receive, from the data loss prevention policy database via the network, the data loss prevention policy category for the sensitive data on the mobile device;

tag, based on the data loss prevention policy category, the sensitive data on the mobile device with a data loss prevention policy tag;

determine that the mobile device is no longer connected to the network;

while the mobile device is not connected to the network, enforce on the mobile device, based on the data loss prevention policy tag, a data loss prevention rule for the data loss prevention category of the sensitive data without communicating with the data loss prevention policy database.

14. The method of claim **1**, wherein the data loss prevention policy category is further based on at least one of:

a data type of the sensitive data;

the data loss prevention rule for the sensitive data.

15. The method of claim **2**, wherein performing the analysis of the portion of the sensitive data comprises running a regular expression against the portion of the sensitive data to determine whether the portion of the sensitive data matches the regular expression.

16. The method of claim **2**, wherein performing the analysis of the portion of the sensitive data comprises searching the portion of the sensitive data for at least one particular string.

17. The method of claim **1**, wherein the portion of the sensitive data comprises at least one of:

a filename of the sensitive data;

a file header of the sensitive data;

a hash of the sensitive data.

18. The method of claim **1**, wherein tagging the sensitive data with the data loss prevention policy tag comprises tagging the sensitive data with a tag that is different than the data loss prevention policy category.

19. The method of claim **1**, wherein the type of risk caused by potential loss of the sensitive data comprises at least one of:

identity theft;

fraud;

corporate espionage;

a breach of confidentiality.

20. The method of claim **4**, wherein the predetermined type of network that is designated for transferring data for data loss prevention analysis comprises at least one of:

a local network;

a non-mobile network;

a network with a large bandwidth.

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